CHAPTER 22

DISEASE PROTECTION

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22.01 GENERAL INFORMATION

This chapter provides information regarding ways to reduce the risk of contacting a disease through exposure to body fluids and environmental conditions.

22.02 PROTECTION KITS AND MOUTH BARRIERS

The Department provides protection kits to employees that administer first aid and/or cardiopulmonary resuscitation (CPR). The protection kits contain the following types of items:

- Latex gloves;
- Face mask/eye shield;
- Biohazard disposal bag;
- Antiseptic towelette;
- Germicidal wipe; and
- CPR (mouth) shield*

* Protection kits do not always contain the same type of CPR mouth shield due to the variety of devices available through different vendors.

Some protection kits may contain a red biohazard bag embossed with the statement "DANGER -- INFECTIOUS WASTE." The bag is used to store first aid supplies that may have been contaminated by a victim's blood or other body fluids. Employees should dispose of the biohazard bag at the accident scene with the attendant medical provider, ambulance attendant, Emergency Medical Technician (EMT), or other appropriated medical personnel.

Adequate supplies of mouth barriers and/or protection kits should be maintained at work sites and in motor vehicles. Supervisors may order additional mouth barriers or protection kits to accommodate their needs.

22.03 BLOODBORNE PATHOGENS

A bloodborne pathogen is a disease-causing organism or virus that is carried by blood or other bodily fluids. The two most significant bloodborne diseases that employees may be exposed to are Hepatitis (inflammation of the liver) B Virus (HBV) and Human Immunodeficiency Virus (HIV). HIV-attacks the body's immune system, causing the disease known as Acquired Immune Deficiency Syndrome or AIDS.

The General Industry Safety Orders (GISO), Section 5193, Bloodborne Pathogen regulation requires precautions in dealing with materials that may have been contaminated by body fluids (including blood and tissues) that may spread infections. This GISO standard applies **only** to employees that may reasonably have occupational exposure to blood or other potentially infectious materials.

Under the California Occupational Safety and Health Administration (Cal-OSHA) standard, occupational exposure applies only to employees who regularly work as health care providers or in similar work disciplines. There are no job descriptions or work activities at Caltrans (including volunteer first aid responders and evacuation monitors) that qualify under the occupational exposure definition.

As the Cal-OSHA Bloodborne Pathogen regulation (Section 5193) **does not apply** to Caltrans employees or its operations, the information contained in the section below is provided for general information only.

Transmission of Bloodborne Pathogens (informational only)

Bloodborne pathogens are transmitted primarily through contact with blood and/or skin tissue may enter your body and infect you through a variety of means including:

- An accident/injury with a contaminated object (anything that can pierce, puncture, or cut your skin). HIV can survive on dry environmental surfaces and at room temperatures for at least one week;
- Open cuts, nicks, rashes, burns, hangnails, and skin abrasions (even dermatitis and acne), as well as mucous membranes of the mouth, eyes, or nose; and
- Indirect transmission, such as touching a contaminated object or surface and transferring the infectious material to your mouth, eyes, nose, or open skin.

To protect yourself against infection, treat all human blood and other bodily fluids as if they are dangerous and able to spread infections. Many people unknowingly carry bloodborne infections and show no symptoms.

Medical Evaluation and Treatment

Caltrans policy does not provide for bloodborne pathogen pre-exposure injections. However, a post-exposure injection may be provided if an employee is exposed or believes he/she has been exposed to a material that may have been contaminated by blood or other bodily fluids.

Employees that believe they have been exposed to bloodbourne pathogens, should be medically evaluated to determine if medical treatment is indicated.

The Cal-OSHA standard requires employers to provide post-exposure HBV vaccines to some work groups. Certain Caltrans work activities may qualify for post-exposure vaccines. Because the Cal-OSHA standard does not specifically apply to Caltrans operations and/or job descriptions, every alleged HBV exposure incident will be handled on a case-by-case basis. Contact the district or Headquarters (HQ) Office of Health and Safety or Workers' Compensation (WC) Program Coordinator for information and assistance. If a post-exposure injection **is** necessary, contact the district WC Coordinator or HQ Office of Health and Safety-Return to Work Coordinator for assistance.

Preventative Methods

The following safeguards are accepted industry-wide prevention methods that must be used together to protect employees and reduce the risk of exposure to bloodborne pathogens:

Housekeeping: Clean and decontaminate all work areas and equipment that may be sources of bloodborne infectious materials. Do not use bare hands or gloves to pick up broken glass (may be contaminated); use tongs or a brush and a dustpan.

To decontaminate spilled blood, use a ratio of one-part household bleach to 64-parts water. To spray-a hard surface, just spray and wipe off. For a porous surface, spray with a solution of one part bleach to ten parts of water and let stand a few minutes before wiping off.

Thorough hand washing will prevent contamination to other surfaces. Use of gloves, face shields, and aprons may also be appropriate. Do not eat, drink, smoke, apply cosmetics or lip balms, or handle contact lenses anywhere exposure to blood or bodily fluids is a possibility.

Employee work practices: The following procedures shall be used on the job to reduce risk of exposure to bloodborne pathogens or infectious materials:

- Immediately report any sharp objects found at the workplace;
- Do not touch sharp objects with your hands; and
- Using caution, remove sharp objects and place in a in puncture-resistant container;

Personal protective equipment (PPE): PPE is equipment that protects from contact with potential infectious materials and may include: gloves; masks; aprons; protective eyewear; or protective CPR ventilation masks. PPE should be used only after all other engineering and administrative controls described above have been exhausted.

22.04 TUBERCULOSIS

Tuberculosis (TB) is a disease caused by bacteria-that usually attacks the lungs but can attack any part of the body. TB was once the leading cause of death in the United States, but slowly began to disappear after an effective drug treatment was discovered in the 1940's. However, sporadic cases of TB outbreaks continue to be reported.

There is a difference between *being infected with* TB and *having* the TB disease. Persons with TB disease need to be under the care of a physician. If TB is not treated, it **can** infect others. However, a person may be infected with TB (harboring the TB bacteria in their body) without succumbing to the disease. In most people, the body's immune system protects them, preventing the bacteria from growing. The bacteria are inactive and an individual may not appear or feel sick; however, the bacteria remain alive in the body and may become active later.

When a person with TB disease coughs or sneezes, bacteria are spread through the air. Employees in the area can become infected when they breathe the aerosolized (stirred up into the air) bacteria. Good ventilation can dilute any airborne bacteria.

Handling a person's linens, books, furniture, or eating utensils does **NOT** spread the infection. Brief exposure to a few TB germs will rarely infect a person; however, close daily contact increases the risk.

A person with TB ***infection*** will have no symptoms. A person with TB ***disease*** may have any, all or none of the following symptoms:

- A cough that will not go away;
- Feeling tired all the time;
- Weight loss;
- Loss of appetite;
- Fever;
- Coughing up blood; and
- Night sweats.

If you think that you have been exposed to TB, see your doctor for a TB skin test. These symptoms can also occur with other diseases so it is important to be medically evaluated to determine if you have TB.

22.05 HANTAVIRUS (ADULT RESPIRATORY DISTRESS SYNDROME)

Hantaviruses are a group of viruses that may be carried by some rodents. Some hantaviruses can cause a rare but deadly disease called Hantavirus Pulmonary Syndrome (HPS). People may get HPS when they breathe in hantaviruses. The disease can be contracted from hantavirus-infected rodent urine and droppings that are stirred up into the air (aerosolized). Infection may also occur by touching the eyes, nose, or mouth after contact with infected mouse or rat urine, droppings, or nesting materials. Additionally, HPS can be caused by a mouse or rat bite. No cases of person-to-person HPS transmission have been reported in the United States.

In North America, hantavirususes may be transmitted by the deer mouse, white-footed mouse, rice rat, and the cotton rat. It is best to avoid all wild mice and rats and to safely clean up any rodent urine, droppings, or nests as it is difficult to determine whether they may be hantavirus-infected. Rodents such as house mice, roof rats, and Norway rats have never been known to transmit HPS to humans.

Inspecting Possible Rodent Colony Habitats

Supervisors responsible for facilities located in rural areas should develop programs to train employees to conduct inspections and take appropriate corrective action before entering and working in the following types of facilities:

- sewage lift stations;
- pump houses;
- fuel storage bunkers;
- tanks;
- GAZ-X avalanche control
- system shelters;
- wet/dry pumping plants;
- sand bunkers;
- bridge cells;
- transmitter stations;
- elevator shafts; and/or
- similar enclosed facilities.

General Precautions to Prevent Rodent Infestation

Supervisors should use the following preventive measures in buildings not currently infested such as maintenance stations, dormitories, surveys or construction field offices, equipment barns and similar storage facilities in rural areas.

To reduce the availability of food sources and nesting sites inside these buildings, employees should:

- store and cover food in rodent-proof containers;
- store garbage inside, when possible, in rodent-proof containers;
- remove food particles from floors and sinks;
- dispose of trash and clutter; and
- use spring-loaded rodent traps.

To prevent rodent access to these buildings employees should:

- use steel wool or cement to seal screens, or otherwise cover openings into buildings larger than 1/4 inch;
- place metal roof flashing around the base of dwellings as a rodent barrier;
- place gravel under the basements of facilities to prevent rodent burrowing;
- locate above-ground woodpiles;
- store grains and animal food in rodent-proof containers;
- haul away trash, abandoned vehicles, discarded tires; and
- use Environmental Protection Agency (EPA)-registered rodenticides approved for outside use.

Management of Buildings with Rodent Infestation

The presence of rodent feces in closets, cabinets, floors, or evidence that rodents have been gnawing on food indicates rodent infestation.

If rodent infestation is detected inside a facility or other structure used by employees, use the following guidelines for rodent abatement:

Protecting yourself from risk of exposure

Never touch a rodent or its droppings or urine with bare hands. Rubber or plastic gloves should be worn when handling dead rodents, contaminated traps, or in cleaning up rodent material. **Gloved** hands should then be washed in household disinfectant followed by soap and water. A sodium hypochlorite solution prepared by mixing three tablespoons of household bleach in one gallon of water is effective.

Protective goggles should be worn if contact with the cleaning material or rodent material is anticipated.

The use of respiratory protection should be considered when contaminated material may become aerosolized. The use of a dust mask to limit general dust exposure and to prevent contact of hands with the mouth and nose should be considered.

Disposing of rodents and rodent material

Except in the immediate area of a confirmed case of hantavirus infection, rodents and rodent material may be disposed of as ordinary household waste in outdoor garbage containers. An occasional rodent carcass in unaffected or urban areas can be disposed of by picking it up with a plastic bag, inverting the bag, placing it in a second bag, and disposing it as typical household waste.

In affected areas and as an additional precaution in rural areas, rodent carcasses and material should be placed in a plastic bag containing a sufficient amount of a general-purpose household disinfectant to thoroughly wet them. Seal the bag and then dispose of it as permitted by local regulations.

Eliminating rodent infestation

Ventilate closed buildings/facilities or areas inside buildings by opening doors and windows for at least 30 minutes. Use an exhaust fan or cross ventilation if possible. Leave the area until the airing-out period is finished. This airing may help remove or dilute any aerosolized virus produced directly by rodent urine.

Seal screens that have a diameter of 1/4 inch or larger or otherwise cover all openings into the building/facility.

Set rodent traps inside the building using peanut butter or other appropriate bait. Use only spring-loaded traps that kill rodents.

Treat the interior of the structure with an insecticide labeled for flea control; follow specific label precautions. Insecticide sprays or powders can be used in place of aerosols if they are appropriately labeled for flea control. Rodenticides may also be used while

the interior is being treated. EPA-approved rodenticides are commonly available. Instructions on product use should be followed.

Wear gloves to remove captured rodents from traps and dispose of in plastic bags, as described above.

Leave several baited spring-loaded traps inside the building at all times as a further precaution against rodent infestation.

Cleaning-up rodent-contaminated areas

Always wear gloves when cleaning up rodents and rodent material.

Spray dead rodents, rodent nests, droppings, or other items that have been contaminated by rodents with a general-purpose household disinfectant. Soak the material thoroughly, place it in a plastic bag, and dispose of according to local regulations.

After the rodents have been removed, spray the area with a disinfectant solution. Mopping floors with the disinfectant is also suggested. TO AVOID GENERATING AEROSOLS, DO NOT VACUUM OR SWEEP-DRY SURFACES BEFORE SPRAYING OR MOPPING.

Disinfect furniture, cabinet tops, and other durable surfaces. If clothing or fabrics have been contaminated, launder with detergent and water as hot as fabric will allow. Machine-dry on a high temperature setting or hang outdoors to air-dry in the sun.

Additional precautions for rodent infestation

Persons involved in the clean-up should wear coveralls, hair coverings, rubber boots, disposable shoe covers, gloves, protective goggles, and an appropriate respiratory protection device, such as a half-mask air-purifying respirator with a high-efficiency particulate air (HEPA) filter or a powered air-purifying respirator with HEPA filter.

The Center for Disease Control has recommended special precautions for cleaning buildings with heavy rodent infestations. Persons conducting these activities should first contact their local health department.

22.06 LYME DISEASE

Lyme disease is a bacterial infection caused by a tick bite. Typical symptoms include fever, headache, fatigue, and skin rash. If left untreated, infection can spread to the joints, ~~the~~ heart, and nervous system. A diagnosis of Lyme disease is based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks. Laboratory testing is helpful in the later stages of disease. Most cases of Lyme disease successfully respond to a few weeks of antibiotic treatment.

Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, landscaping, and integrated pest management. If you believe that you are in a potential tick-exposure area, the following precautions should be taken:

- Wear light colored clothing so that ticks can be easily seen;
- Tuck pant legs into boots or socks and tuck shirt tails into pants;
- Completely inspect your body at least once a day for attached ticks, especially the armpits and groin areas; and
- Never use insecticides, lighted matches or solvents to remove ticks.

After being outdoors in a suspected tick habitat, it is recommended that you remove all clothing, wash and dry it at a high temperature and inspect your body carefully. If you discover a tick, remove it as soon as possible to reduce the chance of infection. Grasp the tick as close to the skin as possible, preferably with fine-nosed tweezers, and pull straight out, slowly and firmly. Proper removal of the tick within 24 hours greatly reduces the chance of Lyme disease infection. Wash your hands and the wound with an antiseptic. Consult your doctor if you believe you may not have removed all of the tick or you begin to experience symptoms.

22.07 SUN SAFETY

Long term exposure to the sun is the leading cause of skin cancer. Skin cancer rates have increased dramatically in the last few decades with 90 percent of skin cancers linked to sun exposure. The damage from exposure accumulates over time.

There are more than 200 different forms of cancer; however, there are only three major forms that actually originate in the skin.

Basal cell carcinomas are the most common and are easily treated. They usually appear as slow growing fleshy bumps or nodules. Basal cell can be found anywhere on the body but is more likely to be on the face, neck, or hands. These tumors do not spread quickly and may take months to reach the diameter of one-half inch.

Squamous cell carcinoma may also appear as a nodule or as a red scaly patch. The second most common skin cancer, squamous cell is generally found on the face, hands, ears, lips and mouth. This cancer will develop into large masses and can spread to other parts of the body.

Malignant Melanoma is the least common but most aggressive and deadly of the three major forms of skin cancer. It usually begins as a light brown or black flat spot with irregular borders that may later become multi-colored with red, blue violet or white. It often grows from a mole.

Lighter/fair skin has less protective melanin (the pigment that gives skin its color). When skin is exposed to ultraviolet (UV) light, more melanin than normal is released in order to protect the skin from damage. This darkening that appears as a "tan" actually signifies damage to the skin ~~is~~ taking place. Exposure to ultraviolet UV light also contributes greatly to premature aging, cataracts and a weakened immune system

Protecting yourself against the solar hazard

Physically blocking the rays from the sun with clothing and shade is the best defense. Whenever possible, wear wide-brimmed hats, long-sleeved shirts and other clothing with a tight weave. Wear sunglasses that filter 100 percent of UV rays.

The Department will not purchase sunscreen for employee use. If an employee chooses to purchase sunscreen, it is recommended that it have a minimum Sun Protection Factor (SPF) of 15. Sunscreens should be purchased and tested by the user to find the type and brand best suited to their needs. Apply according to directions and conditions. SPF protection differs between brands, users, altitude and proximity to the equator. Not all sunscreens protect from both UVA and UVB radiation and one should guard against a false sense of security from their use.

Early Detection
It is recommended that everyone perform a monthly skin check, paying close attention to any moles. Look for changes in the size, shape, or color of moles and any bumps, lumps or red patches. Check your entire body, including between your toes and the soles of your feet.

The A-B-C-D rule to inspect for malignant melanoma
A *Asymmetry*: one half does not look like the other half
B *Border*: the edges are scalloped or ragged looking from one area to another; shades of black, brown, and violet, and sometimes red
C *Color*: varies, blue and white
D *Diameter*: as large as or larger than a pencil eraser (6 mm)

22.08 HEAT STRESS/HEAT ILLNESS

Heat illness is a serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, and heat stroke. This section provides information regarding heat illness, what the symptoms are, what to do if symptoms occur, and prevention methods. The Department's Heat Stress program is based on Cal-OSHA Heat Illness regulation 3395.

Types of Heat Illness

Mild (minor heat problems)

This is the earliest and least serious form of heat stress. Mild heat stress is always reversible and usually not dangerous unless the symptoms persist. Although you can continue work soon after treatment, always inform your supervisor if you experience mild symptoms of heat stress at work.

Signs and Symptoms
- Excessive sweating;
- Painful spasms in muscles during or several hours after activity **(heat cramps);**
- Tiny red bumps on the skin and a prickling sensation **(called prickly heat);** and/or
- Irritability, mild dizziness, or weakness.

What Your Body is Doing
Sweating causes your body to lose water and minerals. Excessive sweating creates an imbalance causing muscles to cramp. When your sweat glands become blocked and inflamed, a rash results. Too little blood flow to the brain causes dizziness and other symptoms.

Treatment -
- Rest in a cool or shady area;
- Drink water or other fluids;
- Use warm moist compresses over cramping muscles, followed by a gentle massage;
- Use a mild drying lotion to relieve the rash; and
- Keep skin dry and clean.

Moderate (heat exhaustion)
Heat exhaustion is a more serious form of heat stress, although the symptoms are usually reversible if treated quickly. You should inform your supervisor immediately if you experience symptoms of moderate heat stress and get medical attention.

Signs and Symptoms
- Excessive sweating;
- Cold, moist, pale, or flushed skin;
- Unusual thirst;
- Extreme weakness or fatigue;
- Headache, nausea, or loss of appetite;
- Dizziness or giddiness; and
- A rapid weak pulse.

What Your Body is Doing
- The loss of too much water and minerals reduces the blood supply to your brain, muscles, and skin. Your heart works harder to maintain the blood supply.

Treatment
- Rest in a cool shady area;
- Drink water or other fluids;
- Take additional salt, if instructed by physician; and
- Use cool compresses on forehead, around the neck, and under armpits.

Severe (heat stroke)
This is a serious, **life-threatening medical emergency**. It can happen in a few hours or less while working in a hot environment. The symptoms are reversible, but if not treated promptly, heat stroke can lead to permanent brain damage or death.

Signs and Symptoms
- Lack of sweating;
- Hot, dry, flushed skin;
- Deep rapid breathing;
- A rapid, weak, and possibly irregular pulse;
- Headache, nausea;
- Dizziness, confusion, or delirium; and
- Loss of consciousness and convulsions.

What Your Body is Doing
When your body becomes so overheated that your sweat glands and other organs cannot function normally, then blood flow and sweat cannot cool your body sufficiently. This can affect vital organs, including your heart and brain, and may cause permanent damage.
Treatment -
- Rest in a cool or shady area;
- Remove outer clothing;
- Lower body temperature with cool compresses or pour water on clothing;
- Increase air movement around body; and
- Drink water or other fluids, and DO NOT "ice down."

Preventing Heat Stress - Checklist
Supervisors and employees should be aware of the health risks associated with working and/or performing work activities in environments that may contribute to heat illness. Knowing what factors can increase your risk will enable you to take steps to reduce problems while working in the heat. The following are suggested ideas and/or steps that supervisors and employees can take to help prevent heat stress:

1. Discuss the increased risks when working in high heat exposure areas such as exposure to radiant heat from mechanical sources or on hot and humid days.
2. Drink plenty of water. Thirst is not a good indicator of how much water your body needs. Drink more water or other fluids than you need to satisfy your thirst. It is best to regularly replenish the water you lose from sweating by drinking small amounts frequently throughout the work shift. Increase the amount of water you drink to replenish.
3. Take preventative recovery periods in shade. Depending on conditions (e.g., air temperature, sun exposure, physical exertion), more recovery periods may be needed.
   - "Preventative recovery period" means a period of **not fewer than 5 minutes** to recover from the heat in order to prevent heat illness.
   - "Shade" means blockage of direct sunlight (objects do not cast a shadow).
4. Wear PPE to guard against heat exposure. When possible, wear comfortable, loose, lightweight clothing that allows body heat to be released. Cover your head.
5. Acclimatize to hot work. This usually requires several days working in the heat for short periods, ~~of~~ gradually increasing work time and intensity. Consider alternative work schedules (work earlier or later) to avoid the times when heat is most severe.
6. Employees in good physical condition tend to better acclimatize because their cardiovascular systems respond more efficiently.
7. Eat light meals. It is better to eat light during the workday when exposed to heat as hot, heavy meals add heat to your body and divert blood to your digestive system.
8. Avoid alcohol, caffeine, and medications, when possible, as they act as diuretics and dehydrate the body. Medications used to control high blood pressure, diabetes or allergies can increase your risk of heat stress.

Training: Formal training shall be provided to all employees before working where environmental risk factors for heat illness are present. Training needs to be recorded in the Labor Management System (LMS). The Heat Illness training course number is 100741.

The Caltrans Heat Stress Program is made up of many components. The three main components are:

- All potentially impacted employees and their supervisors must be trained on the risks and prevention of heat illness, including how to recognize symptoms and respond when they appear.
- **Drinking water in the quantity of one quart per hour** shall be available at all times for employees who work outdoors in the heat.
- **Employees must have access to a shaded area** to prevent or recover from heat illness symptoms.

All employees working on job tasks where environmental risk factors for heat illness are present shall receive instruction **before** being assigned. Training topics shall include the following:

- Environmental and personal risk factors for heat illness, including procedures for identifying, evaluating, and controlling exposures;
- Importance of frequent consumption of small quantities of water when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties;
- Importance of acclimatization and immediately reporting to their supervisor symptoms or signs of heat illness in themselves or in coworkers; and
- Procedures for responding to symptoms of possible heat illness, including how emergency medical services will be contacted and provided, should they become necessary.

Supervisors or their designees are required to provide training on the following topics:

- Information as detailed above in employee training requirements;
- Procedures the supervisor shall follow to implement the provisions of this program; and
- Procedures the supervisor shall follow when an employee exhibits symptoms consistent with possible heat illness, including emergency response.

22.09 COLD STRESS

Unless properly protected from cold, body temperatures drop and some degree of cold stress occurs. Cold temperatures can cause acute effects to the body such as **hypothermia** and **frostbite**.

Hypothermia occurs when the body loses heat faster than it can produce it. Body temperature first drops in the hands and feet. If the body continues to lose heat, involuntary shivers usually begin. This is the first real warning sign of hypothermia. If heat loss continues, the person will become confused and disoriented followed by coma and death, which can follow very quickly.

Frostbite occurs when the hands or feet actually freeze, with crystals of ice forming in the tissues and damaging them. The hand and/or foot may heal if not too severely damaged, but chronic symptoms such as pain, numbness or abnormal skin color may continue for years afterward. In extreme frostbite cases, gangrene may occur and amputation of the affected body part may be necessary.

If you experience any of the above signs, take immediate steps to stop further exposure to cold and seek medical attention as soon as possible.

Supervisors and employees should be able to recognize health risks associated with working in areas and/or performing work activities that may contribute to cold stress. The following items can help prevent cold stress:

- Know which factors contribute to cold stress and discuss ways to reduce cold temperature risks and take appropriate precautions.
- Wear personal protective clothing to protect your head, feet, and hands;
- Avoid alcohol, caffeine and, if possible, medications.
- Acclimatize to cold work environments. This usually requires working in the cold for short periods for several days gradually increasing in time and intensity. Consider alternative work schedules, or work when cold is less severe.
- Minimize exposure to air movement by using vehicles or other physical barriers as windshields for protection from wind and drafts.
- Staying dry and warm. If exposure to water is unavoidable, do not permit the exposure to be prolonged. Have dry clothes available.
- Eat a well-balanced diet and drink plenty of water.
- Materials can be prefabricated or maintenance jobs preformed in warm areas, and then move the product moved to the cold area for final assembly.
- When work is being performed in the cold, rest breaks should be taken in warm areas and hot beverages should be available.
- Cover metal handles of tools and control bars with thermal insulation materials.
- Provide spot heating (portable heaters).

APPENDIX A

WIND-CHILL INDEX

Wind speed in mph	ACTUAL THERMOMETER READING (F)									
	50	40	30	20	10	0	-10	-20	-30	-40
	EQUIVALENT TEMPERATURE (F)									
calm	50	40	30	20	10	0	-10	-20	-30	-40
5	48	37	27	16	6	-5	-15	-26	-36	-47
10	40	28	16	4	-9	-21	-33	-46	-58	-70
15	36	22	9	-5	-18	-36	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	30	16	0	-15	-29	-44	-59	-74	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
Over 40 mph (little added effect)	LITTLE DANGER (for properly clothed person)			INCREASING DANGER (Danger from freezing of exposed flesh)				GREAT DANGER		